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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,624	03/25/2004	Keith Ritter	2004P02001 US	7473
7590	09/09/2005			
			EXAMINER	
			ZETTL, MARY E	
			ART UNIT	PAPER NUMBER
			2878	
DATE MAILED: 09/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/809,624	RITTER, KEITH	
	<b>Examiner</b>	<b>Art Unit</b>	
	Mary Zettl	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on June 9, 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4-6, 8, 14-17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Rozsa (US 6,534,771).

Regarding Claims 1 and 4, Rozsa discloses a gamma camera (Figure 1, item 10) for detecting gamma photon emissions and generating electrical energy (column 1, lines 14-20) comprising of an array of photodectors (photomultiplier tubes; Figure 1 item 32; column 4, lines 53-54) and associated circuitry for detecting and converting light energy to electrical energy (Figure 1 item 36; column 4 lines 55-58); and a scintillation crystal positioned in proximity to an array of photomultiplier tubes for detecting gamma photon emissions and generating light energy (Figure 1, item 22; column 4, lines 47-49), wherein at least one portion of the scintillation crystal includes a first polished area of the scintillation crystal and at least another portion of the scintillation crystal includes a second polished area of the scintillation crystal, and wherein the first and the second areas are polished differently to yield different light response functions for the generated light energy than at least another portion of the scintillation crystal (column 9, lines 55-60).

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Regarding Claim 5 Rozsa discloses the limitations set forth in Claim 1, and further discloses a collimator for intercepting and eliminating gamma photon emissions that are not traveling in an anticipated direction (Figure 1 item 14; column 4, lines 36-38).

Regarding Claim 6, Rozsa discloses the limitations set forth in Claim 1, and further discloses that the scintillation crystal is a sodium iodide-thallium activated (NaI(Tl)) crystal (column 2, lines 66-67).

Regarding Claim 8, Rozsa discloses the limitations set forth in Claim 1, and further discloses a glass (optical window) positioned between the scintillation crystal and the array of photodetectors (Figure 1, item 30; column 4, lines 50-55).

Regarding Claims 14 and 16, Rozsa discloses a method (column 12, lines 22-56) of making a gamma camera plate assembly (including a collimator) comprising the steps of making a scintillation crystal wherein at least one portion of the scintillation crystal yields a different light response function for light energy generated by the scintillation crystal than at least another portion of the scintillation crystal (tuning the scintillation crystal; column 12, lines 22-33); providing an array of photodetectors having associated circuitry; and positioning the scintillation crystal in proximity to the array of photodetectors.

Regarding Claim 17, Rozsa discloses the limitations set forth in Claim 14, and further discloses the step of polishing at least one portion of the scintillation crystal for yielding a different light response function for light energy generated by scintillation crystal than at least another portion of scintillation crystal (Column 12, lines 50-56).

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Regarding Claim 20, Rozsa discloses the method according to Claim 14, and further discloses at least one portion of the scintillation crystal including a first polished area of the scintillation crystal and at least another portion of the scintillation crystal including a second polished area of the scintillation crystal, wherein the first and second polished areas are polished differently to yield a different light response function for the generated light energy (Column 12, lines 31-33).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 3, 7, 9-11, 18 and 19 are rejected under 35 U.S.C. 103(a).

4. Claims 2 and 18 are rejected as being unpatentable over Rozsa (US 6,534,771) in view of Levin (US 6,114,703).

Regarding Claim 2, Rozsa discloses the limitations set forth in Claim 1, and further discloses tuning (polishing or grinding) the surfaces of the crystal so as to vary the amount of internal reflection and scattering at the surfaces of the crystal (Column 3, lines 46-18). Rozsa does not disclose expressly a gamma camera wherein each of the plurality of uniformly polished areas of the crystals is substantially aligned with a respective central axis of a photodector of the array of photodetectors. Levin teaches a scintillation detector array including a "photodector being paired with and aligned with a scintillation crystal" (Column 11 line 40 – Column 12 lines 1-2). Levin additionally teaches that polished surfaces in an end collection setup (photodetectors attached to the end of crystal as opposed to surrounding the crystal) have a higher light collection efficiency than ground surfaces (Figure 6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Rozsa such that the plurality of uniformly polished crystal areas are substantially aligned with the respective central axis of a photodector so that each photodector receives light generated only from the aligned crystal and which aids in producing a uniform image.

Regarding Claim 18, Rozsa discloses the limitations set forth in Claim 17. Rozsa does not disclose expressly a gamma camera wherein each of the plurality of uniformly polished areas of the crystals is substantially aligned with a respective central axis of a photodector of the array of photodetectors. Levin teaches a "photodector being paired with and aligned with a scintillation crystal" (Column 11 line 40 – Column 12 lines 1-2). Levin additionally illustrates (Figure 6) that polished surfaces in an end collection setup (photodetectors attached to the end of crystal as opposed to surrounding the crystal) have a higher light collection efficiency than ground surfaces. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Rozsa such that the surfaces of the crystals were uniformly polished in order to increase light collection efficiency and additionally to substantially align the polished surfaces with the respective central axis of a photodector so that each photodector receives light generated from the aligned crystal and thus produces a uniform image.

5. Claims 3 and 19 are rejected under Rozsa (US 6,534,771) in view of Thompson (US 5,122,667).

Regarding Claim 3, Rozsa discloses the limitations set forth in Claim 1, and further discloses tuning (polishing or grinding) the surfaces of the crystal so as to vary the amount of internal reflection and scattering at the surfaces of the crystal (Column 3, lines 46-18). Rozsa does not disclose expressly the plurality of uniformly polished areas of the crystals being unaligned with a respective central axis of a photodector of the array of photodetectors. Thompson teaches a device using an array of scintillation detectors for medical imaging purposes (Column 1, lines 10-18), including crystals (Figure 3, item 2) that are not substantially aligned with a respective central axis of a photodector (multiple cathode photomultiplier, Figure 3, item 3) so as to provide "spatially distinct samples from front and rear sections of the crystal" (Column 4, lines 23-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Rozsa such that the polished surfaces are not substantially aligned with the respective axis of a photodector in order to produce a narrower light response function and improve the spatial resolution.

Regarding Claim 19, Rozsa discloses the limitations set forth in Claim 17. Rozsa does not disclose expressly a gamma camera wherein each of the plurality of uniformly polished areas of the crystals is not substantially aligned with a respective central axis of a photodector of the array of photodetectors. Thompson teaches crystals (Figure 3, item 2) that are not substantially aligned with a respective central axis of a photodector (multiple cathode photomultiplier, Figure 3, item 3) so as to provide "spatially distinct samples from front and rear sections of the crystal" (Column 4, lines 23-27). It would have been obvious to one having ordinary skill in the art at the time the invention was

made to modify the invention of Rozsa such that the polished surfaces are not substantially aligned with the respective axis of a photodector in order to produce a narrower light response function, and improve the spatial resolution.

6. Claim 7, 9, 12, 13, and 15 are rejected as being unpatentable over Rozsa (US 6,534,771) in view of Majewski (5,864,141).

Regarding Claim 7, Rozsa discloses the limitations set forth in Claim 1 and further discloses a lead shield (housing; column 4, lines 38-40) surrounding the scintillation crystal and the array of photodetectors. Rozsa fails to teach a lead shield that surrounds the circuitry. Majewski teaches a lead shield (screen; Figure 1, item 14; column 3, line 64) surrounding a scintillation crystal (Figure 1, item 18; column 4, line 26), an array of photodetectors (photomultiplier tubes; Figure 1, item 28, column 4, lines 25-26), and associated circuitry (wires and amplifiers; Figure 1, item 34; column 4, lines 28-31). It would have been obvious to one having ordinary skill in the art at the time the invention was made to enclose the assembly of Rozsa with the lead shield as disclosed by Majewski in order to decrease the amount of unwanted background radiation from reaching the detector elements.

Regarding claims 9, 12, and 13 Rozsa teaches a gamma camera (Figure 1, item 10) of the type comprising an array of photodetectors (photomultiplier tubes; Figure 1 item 32; column 4, lines 53-54) and associated circuitry for detecting and converting light energy to electrical energy (Figure 1 item 36; column 4 lines 55-58); a collimator for directing gamma photon emissions towards said scintillation crystal (Figure 1 item 14; column 4, lines 36-38), and a lead shield (housing Figure 1, item 20; column 4,

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lines 38-40) surrounding the scintillation crystal and the array of photodetectors; the scintillation crystal comprising at least one portion yielding a different light response function for light energy generated by the scintillation crystal than at least another portion of the scintillation crystal (column 9, lines 55-60). Rozsa further teaches that the scintillation crystal is a sodium iodide-thallium activated (NaI(Tl)) crystal (column 2, lines 66-67), wherein at least one portion of the scintillation crystal includes a first polished area of the scintillation crystal and at least another portion of the scintillation crystal includes a second polished area of the scintillation crystal, and wherein the first and the second areas are polished differently to yield different light response functions for the generated light energy than at least another portion of the scintillation crystal (column 9, lines 55-60). Rozsa fails to teach a shield that also surrounds the circuitry. Majewski (5,864,141) teaches a lead shield (screen; Figure 1, item 14; column 3, line 64) surrounding a scintillation crystal (Figure 1, item 18; column 4, line 26), array of photodectors (photomultiplier tubes; Figure 1, item 28, column 4, lines 25-26), and associated circuitry (anode wires and amplifiers). It would have been obvious to one having ordinary skill in the art at the time the invention was made to enclose the invention as disclosed by Rozsa with the lead shield as disclosed by Majewski in order to decrease the amount of unwanted background radiation from reaching the detector elements.

Regarding Claim 15, Rozsa discloses the method for assembling a crystal plate assembly, however Rozsa does not expressly disclose an assembly with a lead shield that surrounds not only the scintillation crystal and the array of photodetectors, but also the associated circuitry. Majewski teaches a lead shield (screen; Figure 1, item 14; column 3, line 64) surrounding a scintillation crystal (Figure 1, item 18; column 4, line 26), an array of photodetectors (photomultiplier tubes; Figure 1, item 28, column 4, lines 25-26), and associated circuitry (wires and amplifiers; Figure 1, item 34; column 4, lines 28-31). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Rozsa such that a step consists of surrounding the scintillation crystal, the array of photodetectors, and the associated circuitry with a lead shield as disclosed by Majewski, in order to decrease the amount of unwanted background radiation from reaching the detector elements.

7. Claim 10 is rejected as being unpatentable over Rozsa (US 6,534,771) in view of Majewski (5,864,141) and further in view of Levin (US 6,114,703). Rozsa in view of Majewski disclose the limitations set forth in Claim 9. Rozsa in view of Majewski does not disclose expressly, a scintillation crystal wherein a plurality of uniformly polished crystal areas are substantially aligned with a respective central axis of a photodetector. Levin additionally illustrates (Figure 6) that polished surfaces in an end collection setup (photodetectors attached to the end of crystal as opposed to surrounding the crystal) have a higher light collection efficiency than ground surfaces. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Rozsa in view of Majewski, as suggested by Levin such that the surfaces of

the crystals were uniformly polished in order to increase light collection efficiency and additionally to substantially align the polished surfaces with the respective central axis of a photodector so that each photodector receives light generated from the aligned crystal and thus produces a uniform image.

8. Claim 11 is rejected as being unpatentable over Rozsa (US 6,534,771) in view of Majewski (5,864,141) and further in view of Thompson (US 5,122,667). Rozsa in view of Majewski discloses the limitations set forth in Claim 9. Rozsa in view of Majewski does not disclose expressly, a scintillation crystal wherein a plurality of uniformly polished crystal areas are not substantially aligned with a respective central axis of a photodetector. Thompson teaches a device using an array of scintillation detectors for medical imaging purposes (Column 1, lines 10-18), including crystals (Figure 3, item 2) that are not substantially aligned with a respective central axis of a photodector (multiple cathode photomultiplier, Figure 3, item 3) so as to provide "spatially distinct samples from front and rear sections of the crystal" (Column 4, lines 23-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Rozsa such that the polished surfaces are not substantially aligned with the respective axis of a photodector in order to produce a narrower light response function and improve the spatial resolution.

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Zettl whose telephone number is (571) 272-6007. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MZ



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